FILE 'HOME' ENTERED AT 15:13:23 ON 12 DEC 2006

=> file reg COST IN U.S. DOLLARS

SINCE FILE TOTAL ENTRY SESSION 0.21 0.21

FULL ESTIMATED COST

FILE 'REGISTRY' ENTERED AT 15:13:40 ON 12 DEC 2006
USE IS SUBJECT TO THE TERMS OF YOUR STN CUSTOMER AGREEMENT.
PLEASE SEE "HELP USAGETERMS" FOR DETAILS.
COPYRIGHT (C) 2006 American Chemical Society (ACS)

Property values tagged with IC are from the ZIC/VINITI data file provided by InfoChem.

STRUCTURE FILE UPDATES: 11 DEC 2006 HIGHEST RN 915185-72-7 DICTIONARY FILE UPDATES: 11 DEC 2006 HIGHEST RN 915185-72-7

New CAS Information Use Policies, enter HELP USAGETERMS for details.

TSCA INFORMATION NOW CURRENT THROUGH June 30, 2006

Please note that search-term pricing does apply when conducting SmartSELECT searches.

REGISTRY includes numerically searchable data for experimental and predicted properties as well as tags indicating availability of experimental property data in the original document. For information on property searching in REGISTRY, refer to:

http://www.cas.org/ONLINE/UG/regprops.html

*** YOU HAVE NEW MAIL ***

=>

Uploading C:\Program Files\Stnexp\Queries\10702203.str

L1 STRUCTURE UPLOADED

=> d 11

L1 HAS NO ANSWERS

L1 STR

Structure attributes must be viewed using STN Express query preparation.

=> s 11 full

FULL SEARCH INITIATED 15:14:24 FILE 'REGISTRY'
FULL SCREEN SEARCH COMPLETED - 38 TO ITERATE

100.0% PROCESSED

38 ITERATIONS

4 ANSWERS

SEARCH TIME: 00.00.01

L2 4 SEA SSS FUL L1

=> file caplus

COST IN U.S. DOLLARS

SINCE FILE TOTAL ENTRY SESSION 166.94 167.15

FULL ESTIMATED COST

FILE 'CAPLUS' ENTERED AT 15:14:32 ON 12 DEC 2006 USE IS SUBJECT TO THE TERMS OF YOUR STN CUSTOMER AGREEMENT. PLEASE SEE "HELP USAGETERMS" FOR DETAILS. COPYRIGHT (C) 2006 AMERICAN CHEMICAL SOCIETY (ACS)

Copyright of the articles to which records in this database refer is held by the publishers listed in the PUBLISHER (PB) field (available for records published or updated in Chemical Abstracts after December 26, 1996), unless otherwise indicated in the original publications. The CA Lexicon is the copyrighted intellectual property of the American Chemical Society and is provided to assist you in searching databases on STN. Any dissemination, distribution, copying, or storing of this information, without the prior written consent of CAS, is strictly prohibited.

FILE COVERS 1907 - 12 Dec 2006 VOL 145 ISS 25 FILE LAST UPDATED: 11 Dec 2006 (20061211/ED)

Effective October 17, 2005, revised CAS Information Use Policies apply. They are available for your review at:

```
http://www.cas.org/infopolicy.html
=> s 12
L3
             5 L2
=> dup rem 13
PROCESSING COMPLETED FOR L3
             5 DUP REM L3 (0 DUPLICATES REMOVED)
=> d 14 bib abs hitstr 1-5
T.4
    ANSWER 1 OF 5 CAPLUS COPYRIGHT 2006 ACS on STN
     2005:1001865 CAPLUS
AN
DN
    143:300254
TТ
    Photocleavable fluorescent nucleotides for nucleic acid sequencing on
    chips constructed by 1,3-dipolar azide-alkyne cycloaddition chemistry
IN
     Ju, Jingyue
PA
    The Trustees of Columbia University In the City of New York, USA
SO
    PCT Int. Appl., 50 pp.
    CODEN: PIXXD2
חת
    Patent
LA
    English
FAN.CNT 1
    PATENT NO.
                       KIND
                               DATE
                                          APPLICATION NO.
                                                                  DATE
    -----
                       ----
    WO 2005084367
                     A2 20050915
A3 20051222
PΙ
                                           WO 2005-US6960
                                                                  20050303
    WO 2005084367
           AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH,
            CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD,
            GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC,
            LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI,
            NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SM,
             SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM,
        RW: BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW, AM,
            AZ, BY, KG, KZ, MD, RU, TJ, TM, AT, BE, BG, CH, CY, CZ, DE, DK,
            EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LT, LU, MC, NL, PL, PT,
            RO, SE, SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML,
            MR, NE, SN, TD, TG
PRAI US 2004-550007P
                        P
                               20040303
    This invention provides a method for determining the sequence of a DNA or an
    RNA, wherein (i) about 1000 or fewer copies of the DNA or RNA are bound to
     a solid substrate via 1,3-dipolar azide-alkyne cycloaddn. chemical and (ii)
     each copy of the DNA or RNA comprises a self-priming moiety.
     nucleic acid is contacted with a DNA or RNA polymerase and 4
    photocleavable fluorescent nucleotide analogs under conditions permitting
     nucleic acid synthesis. The identity of the incorporated nucleotide is
     determined, each of the nucleotide analogs having a different fluorescent
    wavelength from the other three.
IT
     857285-10-0
    RL: ARG (Analytical reagent use); ANST (Analytical study); USES (Uses)
        (photocleavable fluorescent nucleotides for nucleic acid sequencing on
       chips constructed by 1,3-dipolar azide-alkyne cycloaddn. chemical)
RN
     857285-10-0 CAPLUS
CN
     1H,5H,11H,15H-Xantheno[2,3,4-ij:5,6,7-i'j']diquinolizin-18-ium,
     9-[5-[[[3-[1-[[[3-[4-amino-7-[2-deoxy-5-0-[hydroxy[[hydroxy(phosphonooxy]]]]]]]]]]
     ) phosphinyl] -\beta-D-erythro-pentofuranosyl] -7H-
    pyrrolo[2,3-d]pyrimidin-5-yl]-2-propynyl]amino]carbonyl]oxy]ethyl]-4-
     nitrophenyl]methyl]amino]carbonyl]-2-carboxyphenyl]-2,3,6,7,12,13,16,17-
     octahydro-, inner salt (9CI) (CA INDEX NAME)
```

$$-02C$$
 $-02C$
 $NO2$
 $NO3$
 NO

PAGE 1-B

PAGE 2-B



L4 ANSWER 2 OF 5 CAPLUS COPYRIGHT 2006 ACS on STN

AN 2005:424578 CAPLUS

DN 143:110290

TI Four-color DNA sequencing by synthesis on a chip using photocleavable fluorescent nucleotides

AU Seo, Tae Seok; Bai, Xiaopeng; Kim, Dae Hyun; Meng, Qinglin; Shi, Shundi; Ruparel, Hameer; Li, Zengmin; Turro, Nicholas J.; Ju, Jingyue

CS Columbia Genome Center, Columbia University College of Physicians and Surgeons, New York, NY, 10032, USA

Proceedings of the National Academy of Sciences of the United States of America (2005), 102(17), 5926-5931 CODEN: PNASA6; ISSN: 0027-8424

PB National Academy of Sciences

DT Journal

LA English

AB We report four-color DNA sequencing by synthesis (SBS) on a chip, using four photocleavable fluorescent nucleotide analogs (dGTP-PC-Bodipy-FL-510, dUTP-PC-R6G, dATP-PC-ROX, and dCTP-PC-Bodipy-650) (PC, photocleavable; Bodipy, 4,4-difluoro-4-bora-3 α ,4 α -diaza-s-indacene; ROX, 6-carboxy-X-rhodamine; R6G, 6-carboxyrhodamine-6G). Each nucleotide analog consists of a different fluorophore attached to the 5 position of the pyrimidines and the 7 position of the purines through a photocleavable 2-nitrobenzyl linker. After verifying that these nucleotides could be successfully incorporated into a growing DNA strand in a solution-phase polymerase reaction and the fluorophore could be cleaved using laser irradiation (\approx 355 nm) in 10 s, we then performed an SBS reaction on a chip that contains a self-priming DNA template covalently immobilized by using 1,3-dipolar azide-alkyne cycloaddn. The DNA template was produced by PCR, using an azido-labeled primer, and the self-priming moiety was attached to the immobilized DNA template by enzymic ligation. Each cycle of SBS consists of the incorporation of the photocleavable fluorescent nucleotide into the DNA, detection of the fluorescent signal, and photocleavage of the fluorophore. The entire process was repeated to identify 12 continuous bases in the DNA template. These results demonstrate that photocleavable fluorescent nucleotide analogs can be incorporated accurately into a growing DNA strand during a polymerase reaction in solution and on a chip. Moreover, all four fluorophores can be detected and then efficiently cleaved using near-UV irradiation, thereby allowing continuous identification of the DNA template sequence. Optimization of the steps involved in this SBS approach will further

PAGE 2-B

RE.CNT 22 THERE ARE 22 CITED REFERENCES AVAILABLE FOR THIS RECORD ALL CITATIONS AVAILABLE IN THE RE FORMAT

L4 ANSWER 3 OF 5 CAPLUS COPYRIGHT 2006 ACS on STN

AN 2002:778224 CAPLUS

DN 137:289902

TI DNA sequencing by mass spectrometry using mass-tagged solid phase capturable dideoxynucleotides having cleavable linker

IN Ju, Jingyue; Edwards, John Robert; Li, Zengmin

PA The Trustees of Columbia University in the City of New York, USA

SO PCT Int. Appl., 97 pp.

CODEN: PIXXD2

```
DT Patent
LA English
FAN.CNT 1
```

```
PATENT NO.
                         KIND
                                 DATE
                                            APPLICATION NO.
                                                                    DATE
                         ----
                                             -----
                                 -----
PΙ
     WO 2002079519
                          A1
                                 20021010
                                           WO 2002-US9752
                                                                     20020329
         W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN,
             CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH,
             GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR,
             LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH,
             PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TN, TR, TT, TZ,
         UA, UG, UZ, VN, YU, ZA, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW, AT, BE, CH,
             CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR,
             BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG
     US 2003027140
                          A1
                                 20030206
                                           US 2001-823181
                                                                     20010330
     CA 2442862
                          AA
                                 20021010
                                             CA 2002-2442862
                                                                     20020329
     EP 1383923
                          A1
                                 20040128
                                             EP 2002-728606
                                                                     20020329
         R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT,
             IE, SI, LT, LV, FI, RO, MK, CY, AL, TR
     JP 2004533608
                          T2
                                 20041104
                                             JP 2002-577927
                                                                     20020329
PRAI US 2001-823181
                          Α
                                 20010330
     WO 2002-US9752
                          W
                                 20020329
```

The present application discloses the use of biotinylated AB dideoxynucleotides for a high fidelity DNA sequencing system by mass spectrometry. Biotinylated dideoxynucleotides and streptavidin coated magnetic beads can be used to generate high quality sequencing mass spectra of Sanger cycle sequencing DNA fragments on a MALDI-TOF mass spectrometer. The method disclosed here provides an efficient way to eliminate false stopped DNA fragments and excess primers and salts in one simple purification step, while still allowing the use of cycle sequencing to generate a high yield of sequencing fragments. The subject application discloses that mass-tagged dideoxynucleotides which are coupled with biotin or photocleavable biotin can increase the mass separation of the DNA sequencing fragments on the mass spectra, giving better resolution than previously achievable. Also, this application discloses a method for creating streptavidin-coated porous channels that can be used in light directed cleavage of the biotin-streptavidin complex. This is important as present com. available streptavidin coated magnetic beads are inadequate for photocleavage purposes, in that they are opaque to UV light. Compared to gel electrophoresis sequencing, this system produces very high resolution of sequencing fragments and extremely fast separation in the

time scale of microseconds. The invention provides a linker for attaching a chemical moiety to a dideoxynucleotide, wherein the linker comprises a derivative of 4-aminomethylbenzoic acid. The invention provides a labeled dideoxynucleotide, which comprises a chemical moiety attached via a linker to a 5-position of cytosine or thymine or to a 7-position of adenine or guanine. The invention provides a' method of increasing mass spectrometry resolution between different DNA sequencing fragments, which comprises attaching different linkers to different dideoxynucleotides used to terminate a DNA sequencing reaction and generate different DNA sequencing fragments, wherein the different linkers increase mass separation between the different DNA sequencing fragments, thereby increasing mass spectrometry resolution

IT 467218-69-5

RL: ARG (Analytical reagent use); ANST (Analytical study); USES (Uses) (ddATP-Linker II-PC-Biotin; DNA sequencing by mass spectrometry using mass-tagged solid phase capturable dideoxynucleotides having cleavable linker)

RN 467218-69-5 CAPLUS

CN Carbamic acid, [3-[4-amino-7-[(2R,5S)-tetrahydro-5-(3,5,7,7-tetrahydroxy-3,5,7-trioxido-2,4,6-trioxa-3,5,7-triphosphahept-1-yl)-2-furanyl]-7H-pyrrolo[2,3-d]pyrimidin-5-yl]-2-propynyl]-, 1-[5-[[[6-[[5-[(3aS,4S,6aR)-

hexahydro-2-oxo-1H-thieno[3,4-d]imidazol-4-yl]-1-oxopentyl]amino]-1-oxohexyl]amino]methyl]-2-nitrophenyl]ethyl ester (9CI) (CA INDEX NAME)

Absolute stereochemistry.

PAGE 1-A

PAGE 1-B

RE.CNT 5 THERE ARE 5 CITED REFERENCES AVAILABLE FOR THIS RECORD ALL CITATIONS AVAILABLE IN THE RE FORMAT

L4 ANSWER 4 OF 5 CAPLUS COPYRIGHT 2006 ACS on STN

AN 2002:276113 CAPLUS

DN 136:305088

TI Massively parallel nucleic acid sequencing using dye-labeled nucleotides with 3'-hydroxy groups protected by a small labile moiety and immobilized hairpin loop primers

IN Ju, Jingyue; Li, Zengmin; Edwards, John Robert; Itagaki, Yasuhiro

PA The Trustees of Columbia University In the City of New York, USA

SO PCT Int. Appl., 121 pp.

CODEN: PIXXD2

DT Patent

LA English

FAN.CNT 2

	PATENT NO.				KIND		DATE			APPLICATION NO.					DATE			
PI	WO 2002029003			A2		20020411			WO 2001-US31243						20011005			
	WO	2002	0290	03		A3		2002	0718									
		W:	ΑE,	AG,	AL,	AM,	AT,	ΑU,	ΑZ,	BA,	BB,	BG,	BR,	BY,	BZ,	CA,	CH,	CN,
								DK,										
			GM,	HR,	HU,	ID,	IL,	IN,	IS,	JP,	KE,	KG,	KP,	KR,	KZ,	LC,	LK,	LR,

LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, PH, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, UZ, VN, YU, ZA, ZW RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW, AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG CA 2425112 AA 20020411 CA 2001-2425112 20011005 AU 2001096645 **A5** 20020415 AU 2001-96645 20011005 EP 1337541 20030827 **A2** EP 2001-977533 20011005 AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR JP 2004510433 Т2 20040408 JP 2002-532574 20011005 PRAI US 2000-684670 20001006 Α US 2001-300894P P 20010626 WO 2001-US31243 W 20011005 MARPAT 136:305088

os

AB This invention provides methods for attaching a nucleic acid to a solid surface and for sequencing nucleic acid by detecting the identity of each nucleotide analog after the nucleotide analog is incorporated into a growing strand of DNA in a polymerase reaction. The invention also provides nucleotide analogs which comprise unique labels, such as mass labels or fluorescent dyes, attached to the nucleotide analog through a cleavable linker, and a cleavable chemical group to cap the -OH group at the 3'-position of the deoxyribose. The method uses an array of immobilized primers in which the primers are partially double stranded and form a hairpin loop. As individual bases are incorporated by primer extension, they are identified by the nature of the reporter group. The 3'-blocking group is then removed and the next base is added to primer extension product.

ΙT 407581-93-5 407581-95-7

> RL: ARU (Analytical role, unclassified); ANST (Analytical study) (DNA sequencing using; massively parallel sequencing using dye-labeled nucleotides with 3'-hydroxy groups protected by small labile moiety and immobilized hairpin loop primers)

RN 407581-93-5 CAPLUS

CN Carbamic acid, [3-[4-amino-7-[2-deoxy-5-0-[hydroxy[[hydroxy(phosphonooxy)p hosphinyl]oxy]phosphinyl]-3-0-(methoxymethyl)- β -D-erythropentofuranosyl]-7H-pyrrolo[2,3-d]pyrimidin-5-yl]-2-propynyl]-, C-[1-[5-[[(3',6'-dihydroxy-3-oxospiro[isobenzofuran-1(3H),9'-[9H]xanthen]-6-yl)carbonyl]amino]methyl]-2-nitrophenyl]ethyl] ester (9CI) (CA INDEX NAME)

PAGE 1-A

N H

RN 407581-95-7 CAPLUS

CN Carbamic acid, [3-[4-amino-7-[2-deoxy-5-O-[hydroxy[[hydroxy(phosphonooxy)p hosphinyl]oxy]phosphinyl]-3-O-2-propenyl-β-D-erythro-pentofuranosyl]-7H-pyrrolo[2,3-d]pyrimidin-5-yl]-2-propynyl]-, C-[1-[5-[[[(3',6'-dihydroxy-3-oxospiro[isobenzofuran-1(3H),9'-[9H]xanthen]-6-yl)carbonyl]amino]methyl]-2-nitrophenyl]ethyl] ester (9CI) (CA INDEX NAME)

Absolute stereochemistry.

NH₂

O₂N

L4 ANSWER 5 OF 5 CAPLUS COPYRIGHT 2006 ACS on STN

AN 2002:575630 CAPLUS

DN 137:136024

TI Massively parallel nucleic acid sequencing using dye-labeled nucleotides with 3'-hydroxy groups protected by a small labile moiety and immobilized hairpin loop primers

IN Ju, Jingyue; Li, Zengmin; Edwards, John Robert; Itaqaki, Yasuhiro

PA The Trustees of Columbia University in the City of New York, USA

SO U.S. Pat. Appl. Publ., 54 pp., Cont.-in-part of U.S. Ser. No. 684,670. CODEN: USXXCO

DT Patent

LA English

FAN.CNT 2

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE		
				-		
PI US 2002102586	A1	20020801	US 2001-972364	20011005		
US 6664079	В2	20031216				
US 2004185466	A1	20040923	US 2003-702203	20031106		
PRAI US 2000-684670	A2	20001006				
US 2001-300894P	P	20010626				
US 2001-972364	A 3	20011005				
00 WADDAM 107 106004						

OS MARPAT 137:136024

This invention provides methods for attaching a nucleic acid to a solid AB surface and for sequencing nucleic acid by detecting the identity of each nucleotide analog after the nucleotide analog is incorporated into a growing strand of DNA in a polymerase reaction. The invention also provides nucleotide analogs which comprise unique labels attached to the nucleotide analog through a cleavable linker, and a cleavable chemical group to cap the -OH group at the 3'-position of the deoxyribose. The invention also provides nucleotide analogs which comprise unique labels, such as mass labels or fluorescent dyes, attached to the nucleotide analog through a cleavable linker, and a cleavable chemical group to cap the -OH group at the 3'-position of the deoxyribose. The method uses an array of immobilized primers. As individual bases are incorporated by primer extension, they are identified by the nature of the reporter group. The reporter moiety and the 3'-blocking group are then removed and the next base is added to primer extension product.

IT 407581-93-5 407581-95-7

RL: ARU (Analytical role, unclassified); ANST (Analytical study)
(DNA sequencing using; massively parallel sequencing using dye-labeled nucleotides with 3'-hydroxy groups protected by small labile moiety and immobilized hairpin loop primers)

RN 407581-93-5 CAPLUS

CN Carbamic acid, [3-[4-amino-7-[2-deoxy-5-O-[hydroxy([hydroxy(phosphonooxy)p
hosphinyl]oxy]phosphinyl]-3-O-(methoxymethyl)-β-D-erythropentofuranosyl]-7H-pyrrolo[2,3-d]pyrimidin-5-yl]-2-propynyl]-,
C-[1-[5-[[(3',6'-dihydroxy-3-oxospiro[isobenzofuran-1(3H),9'-[9H]xanthen]6-yl)carbonyl]amino]methyl]-2-nitrophenyl]ethyl] ester (9CI) (CA INDEX
NAME)

Absolute stereochemistry.

PAGE 1-B

RN 407581-95-7 CAPLUS

CN Carbamic acid, [3-[4-amino-7-[2-deoxy-5-O-[hydroxy[[hydroxy(phosphonooxy)p hosphinyl]oxy]phosphinyl]-3-O-2-propenyl-β-D-erythro-pentofuranosyl]-7H-pyrrolo[2,3-d]pyrimidin-5-yl]-2-propynyl]-, C-[1-[5-[[(3',6'-dihydroxy-3-oxospiro[isobenzofuran-1(3H),9'-[9H]xanthen]-6-yl)carbonyl]amino]methyl]-2-nitrophenyl]ethyl] ester (9CI) (CA INDEX NAME)

PAGE 1-B